CLAIMS

1. A method for determining the phase of a complex number corresponding to an input signal, the method comprising the acts of:

normalizing (106) the complex number to obtain a normalized complex number;

processing (108) the normalized complex number through a closed loop to produce a signal that is proportional to the phase of the complex number; and

determining (110, 112) the phase of the complex number from the signal that is proportional to the phase of the complex number.

2. The method of claim 1, comprising:

receiving (104) an Orthogonal Frequency Division Multiplexing (OFDM) signal; and

wherein the complex number corresponds to at least a portion of the OFDM signal.

3. The method of claim 1, wherein the act of processing the normalized complex number comprises waiting (110) for loop convergence.

4. The method of claim 3, wherein the act of waiting (110) is performed for a predetermined number of clock cycles.

5. The method of claim 1, wherein the act of determining the phase comprises dividing (112) the signal that is proportional to the phase of the complex number by a number to yield the phase of the complex number.

6. The method of claim 4 wherein the number is two.

7. The method of claim 1 wherein the act of normalizing (106) the complex number comprises:

inverting (90) the complex number to obtain an inverted complex number;

determining (92) a complex conjugate of the inverted complex number; and

multiplying (94) the complex conjugate of the inverted complex number by the complex number.

8. The method of claim 1 wherein the act of normalizing (106) the complex number comprises:

squaring (62) a magnitude of the complex number to produce a squared complex number magnitude;

inverting (66) the squared complex number magnitude to produce an inverted squared complex number magnitude;

squaring (64) the complex number to obtain a squared complex number; and

multiplying (68) the inverted squared complex number magnitude by the squared complex number.

9. A device that determines the phase of a complex number, the device comprising:

circuitry (62-68) that normalizes the complex number to produce a normalized complex number; and

a closed loop circuit (70-84) that receives the normalized complex number and produces an output that is proportional to the phase of the complex number.

10. The device of claim 9, wherein the device is contained in an Orthogonal Frequency Division Multiplexing (OFDM) receiver.

11. The device of claim 9, wherein the output (86) that is proportional to the phase of the complex number is twice the phase of the complex number.

12. The device of claim 9, wherein the normalized complex number is presented to the closed loop circuit for a predetermined period of time.

13. The device of claim 12 wherein the predetermined period of time corresponds to a predetermined number of clock cycles.

14. The device of claim 9 wherein the circuitry that normalizes the complex number comprises:

circuitry (90) adapted to invert the complex number to obtain an inverted complex number;

circuitry (92) adapted to determine a complex conjugate of the inverted complex number; and

circuitry (94) adapted to multiply the complex conjugate of the inverted complex number by the complex number.

15. The device of claim 9 wherein the circuitry that normalizes the complex number comprises:

circuitry (62) adapted to square a magnitude of the complex number to produce a squared complex number magnitude;

circuitry (66) adapted to invert the squared complex number magnitude to produce an inverted squared complex number magnitude;

circuitry (64) adapted to square the complex number to obtain a squared complex number; and

circuitry (68) adapted to multiply the inverted squared complex number magnitude by the squared complex number.

16. An Orthogonal Frequency Division Multiplexing (OFDM) receiver, comprising:

circuitry that receives a transmitted OFDM signal and converts at least a portion of the transmitted OFDM signal into a complex number;

circuitry (62-68) that normalizes the complex number to produce a normalized complex number; and

a closed loop circuit (70-84) that receives the normalized complex number and produces an output that is proportional to the phase of the complex number.

17. The OFDM receiver of claim 16, wherein the output that is proportional to the phase of the complex number is twice the phase of the complex number.

18. The OFDM receiver of claim 16, wherein the normalized complex number is presented to the closed loop circuit for a predetermined number of clock cycles.

19. The OFDM receiver of claim 16 wherein the circuitry that normalizes the complex number comprises:

circuitry (90) adapted to invert the complex number to obtain an inverted complex number;

circuitry (92) adapted to determine a complex conjugate of the inverted complex number; and

circuitry (94) adapted to multiply the complex conjugate of the inverted complex number by the complex number.

20. The OFDM receiver of claim 16 wherein the circuitry that normalizes the complex number comprises:

circuitry (62) adapted to square a magnitude of the complex number to produce a squared complex number magnitude;

circuitry (66) adapted to invert the squared complex number magnitude to produce an inverted squared complex number magnitude;

circuitry (64) adapted to square the complex number to obtain a squared complex number; and

circuitry (68) adapted to multiply the inverted squared complex number magnitude by the squared complex number.